INSTRUCTIONS

CROSSHEADS AND GUIDES
GENERAL ELECTRIC DIESEL ENGINES

FIG. 1, E-14927A

FIG. 2, E-9925

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DESCRIPTION

GENERAL

Three crosshead assemblies are mounted in the engine frame under each cylinder. The crossheads transmit reciprocating force from the cams to the pushrods to operate the valves and the fuel injection pump on each cylinder. See Fig. 1.

The assemblies for the air and exhaust valves are alike and consist of two major parts: the crosshead with its hardened roller, and a guide in which the crosshead operates. See Fig. 2.

Parts of the fuel crosshead assembly are similar in appearance, but are not interchangeable with those for the valves. The fuel crosshead assembly consists of the following major parts: a guide, spring retainer, spring, and crosshead. The fuel crosshead assembly, when installed in the engine, is spring-loaded to insure the crosshead and its roller will run smoothly on the lobe of the camshaft. See Fig. 5.

*Revisions are indicated by marginal bars.

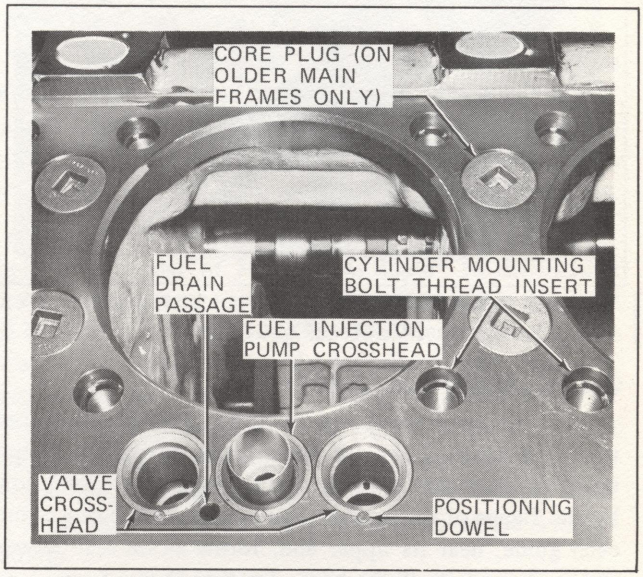

FIG. 1. CYLINDER LOCATION WITH CROSSHEADS INSTALLED.

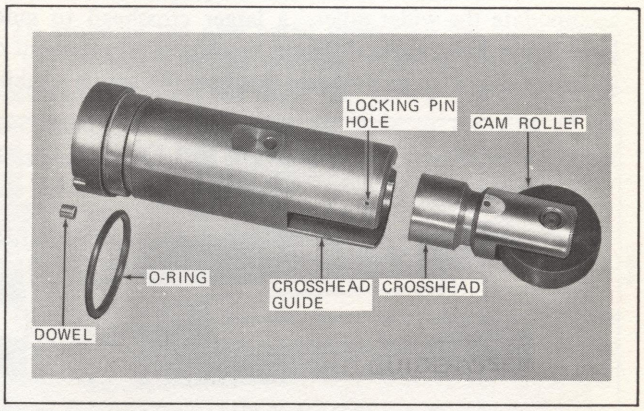

FIG. 2. VALVE CROSSHEAD AND GUIDE ASSEMBLY.

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

Verify numbers for parts, tools, or material by using the Renewal Parts or Tool Catalogs, or contact your General Electric representative for assistance. Do not order from this publication.

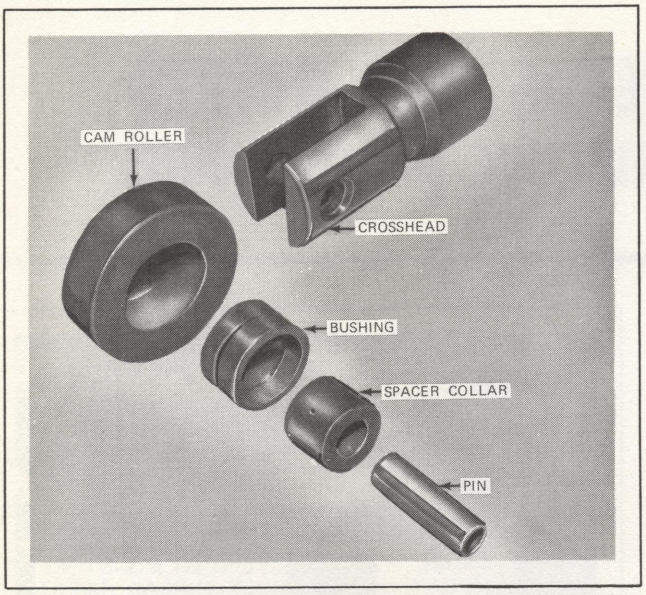

FIG. 3. VALVE CROSSHEAD ROLLER ASSEMBLY. (PART 124X1033-4).

VALVE CROSSHEAD GUIDES

The valve crosshead guides are identical and interchangeable. They are individually positioned in their bores in the main frame by dowel pins and are held down by the flange of the cylinder above them. An O-ring around each guide, near its upper end, forms an oil seal between the guide and its frame bore. Another O-ring forms a seal between the cylinder base and the crosshead guides.

FUEL CROSSHEAD GUIDES

The fuel crosshead guide is positioned and sealed in the same manner as the valve crosshead guides. It differs from those for the valves in having a wider roller guide slot to accomodate the wider roller, a larger crosshead to guide locking pin hole, and a different machining arrangement on its inside diameter to properly position the spring retainer.

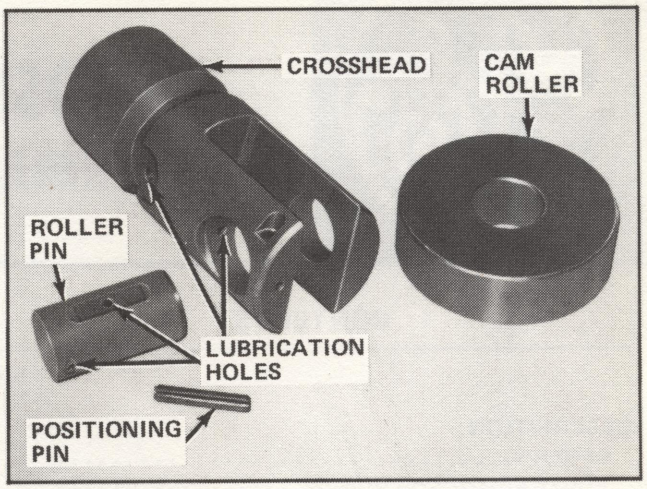

FIG. 4. VALVE CROSSHEAD ROLLER ASSEMBLY. (PART 124X1068).

VALVE CROSSHEADS

Two designs of crossheads have been used and they are:

1. Part 124X1033-4 – Used until early 1978. This crosshead (Fig. 3) had a hardened pushrod bearing at its upper end, and a hardened cam roller operating on a free-floating steel bushing at its lower end.
2. Part 124X1068 – Used starting in early 1978. This crosshead (Fig. 4) had a hardened pushrod bearing at its upper end, and a hardened cam roller operating on a bronze pin at its lower end.

Both crossheads are interchangeable as a complete assembly and can be used in either the air or exhaust position.

Drilled oil passages in the crosshead and crosshead guide and an annular groove around the crosshead permit intermittent oil flow upward through each valve pushrod to lubricate the upper cylinder parts.

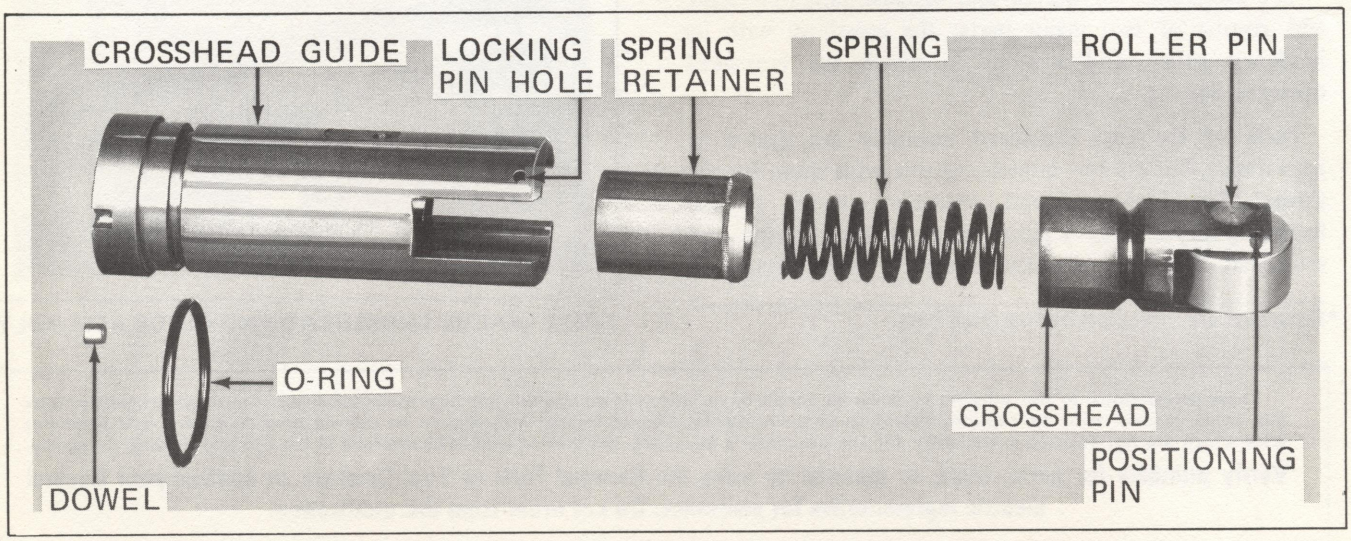

FIG. 5. SPRING-LOADED FUEL CROSSHEAD AND GUIDE ASSEMBLY.

FIG. 3, E-11677
FIG. 4, E-26450
FIG. 5, E-14928

FUEL CROSSHEADS

Fuel crossheads are similar in appearance, but are not interchangeable with valve crossheads. They are arranged with different oil passages and can be identified by the flat tappet-rod bearing insert at their upper end. The fuel crossheads have a wider cam roller which is held in place by a large roller pin and a positioning pin (see Fig. 5).

CROSSHEAD AND GUIDE MAINTENANCE

REMOVAL AND INSTALLATION

After the cylinder has been removed, the crosshead assemblies and positioning dowel pins can be pushed upward and removed. To lock the valve crosshead in its guide, bend a piece of 1/16-in. iron wire about one inch long into an "ell" shape. Push the crosshead up in its guide, and insert the lockwire through the 1/8-in. locking hole from the guide bore outward. The end of the wire must not protrude beyond the guide, or it will interfere during guide removal. Use the same procedure for locking the fuel crosshead in its guide as is used for the valve crosshead, but use a 3/16-in. wire in 1/4-in. guide locking hole.

A crosshead and guide may be renewed without completely removing the cylinder. With the piston at top dead center, disconnect the cylinder and lift it just high enough to permit removal of the crosshead assembly, but not high enough to disengage the piston rings from the cylinder bore. Immerse crosshead in SAE-10 lubricating oil for five minutes, then install the new crosshead assembly with lubricant applied to the sealing O-ring. Position the assembly and insert the dowel. Apply new O-rings to the pushrod ferrules. Then restore the cylinder to position and reconnect.

NOTE: *Use care when handling crossheads and guides. Burrs may be formed on the edge of the guide bore if the crosshead is dropped into the guide with the guide inverted. Burrs must be removed to prevent binding of the crosshead during operation. Also, in case of a pushrod failure, the crosshead will probably be stuck in the guide and should be carefully inspected for damage.*

INSPECTION

Thoroughly clean the assemblies after removal from the engine, and inspect as follows:

1. Check the crosshead exterior and the guide bore for scuffing and galling. If the lubrite coating on the outside diameter of the crosshead has worn through, coat the surface with molybdenum-disulphide spray or a suitable equivalent. Check the running clearance by inserting a feeler gage between the crosshead and its guide bore. See the DATA section.
2. Check the crosshead roller face for roughness, scuffing or flat spots. Make sure the roller rotates freely. Check the hardened pushrod inserts for scuffing, cracks or looseness.
3. Check the roller running clearance by placing the crosshead on a flat surface with its roller facing upward. Using a dial indicator, lift the roller by hand and indicate vertical movement of the roller. See the DATA section.

VALVE CROSSHEAD ROLLER AND BEARING ASSEMBLIES, PART 124X1033-4 (See Fig. 3)

To renew the cam-roller bearing assembly, proceed as follows. First remove the roller pin. Using a 9/16-in. diameter drill, carefully remove the rolled edge from one end of the pin. Then, using a flat punch, drive the pin from the crosshead. Remove the roller, spacer collar and bushing.

Assemble the new parts to the crosshead as follows. Apply a thin coat of Molykote G-Rapid* to the outside diameter of the spacer collar and to the outside diameter and both faces of the bushing. Insert the bushing and spacer collar into the roller. Assemble the roller to the crosshead, using a new pin. Use a drift having a ball-end or a ball bearing of appropriate size to flare or roll the pin ends, thus securing the pin in position. When properly assembled, the pin and spacer collar must be secured from turning while the roller and its bushing must be free to rotate without binding.

VALVE CROSSHEAD ROLLER ASSEMBLIES, PART 124X1068 (See Fig. 4)

To renew the roller and pin assembly, proceed as follows. First remove the positioning pin from the side of the crosshead; then taking care not to distort the crosshead, remove the roller pin, driving it from the crosshead.

To assemble the new parts, super-cool the roller pin to −120 F (−84 C) before starting. Place the roller in the crosshead and insert the roller pin, taking care to align the positioning pin groove with the hole in the side of the crosshead. Insert the positioning pin into place, and make sure the roller runs freely.

FUEL CROSSHEAD ROLLER ASSEMBLIES (See Fig. 5)

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*Product of Dow Corning Corp.

CROSSHEAD BEARING INSERTS

To renew a push-rod or tappet-rod bearing, proceed as follows. Remove the insert by first removing the upset metal which secures the insert in place. Clean the seat and install a new hardened insert. Using a punch, upset the metal over the new insert at four points slightly removed from the original upsets.

DATA

	Min. New		Max. New		Worn Limit	
	In.	mm	In.	mm	In.	mm
Crossheads and Guides (Valve) – Part 124X1033-4						
Running clearance on diameter, crosshead to guide						
Original production	0.0015	0,038	0.0035	0,089	0.0065	0,165
Current production	0.0035	0,089	0.0055	0,140	0.0065	0,165
Crosshead roller, vertical movement on collar	0.0045	0,114	0.0066	0,168	0.009	0,229
Slot width, crosshead guide*	0.880	22,352	0.885	22,479		
Crossheads and Guides (Valve) – Part 124X1068						
Running clearance on diameter, crosshead to guide	0.0015	0,038	0.0035	0,089	0.0065	0,165
Crosshead roller, vertical movement on pin	0.002	0,051	0.0035	0,089	0.007	0,178
Crossheads and Guides (Fuel Pump)						
Running clearance on diameter, crosshead to guide	0.0015	0,038	0.0035	0,089	0.0065	0,165
Crosshead roller, vertical movement on pin	0.002	0,051	0.0035	0,089	0.007	0,178

*Earlier models with 0.817/0.822 in. (20,752/20,879 mm) wide slots should be machined to this dimension.

TRANSPORTATION SYSTEMS BUSINESS DIVISION
ERIE, PENNSYLVANIA 16531

GENERAL ELECTRIC

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11-79 (1500) WHT
2-81 (2000) WHT

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